KOCHNEV, F.P., prof., doktor tekhn.nauk

Selecting directions for passenger train routes. Zhel.dor.transp. 41 no.3:55-56 Mr '59. (MIRA 12:6)
(Railroads--Passenger traffic)

KOCHNEV, F., prof.;.doktor tekhn. nauk

Foreword. Trudy MIIT no.116:3-4 '59. (MIRA 12:11)

1. Nachal'nik Moskovskogo instituta inzhenerov zheleznodorozhnogo transporta im. I.V. Stalina.
(Railroads--Labor productivity)

KOCHENEV, V.P., prof., doktor tekhn.nauk

New trends in scientific, research, and educational institutes, structural design bureaus and laboratories. Elek.i tepl.tiaga 4 no.2:28 F '60. (MIRA 13:6)

1. Nachal'nik Moskovskogo instituta inzhenerov zheleznodorozhnogo transporta.
(Electric engineering--Study and teaching)

KOCHNEV, F.P., prof., doktor tekhn.nauk

Determining the detention time of cars in classification yards.
Zhel.dor.transp. 42 no.6:84-89 Je '60. (MIRA 13:7)
(Railroads--Freight cars)

KOCHNEV, Fedor Petrovich, doktor tekhn.nauk, prof.; MAKSIMOVICH, Boris Mikhaylovich, kand.tekhn.nauk, dotsent; SOTNIKOV, Isaak Bentsionovich, kand.tekhn.nauk, dotsent; SIMONOV, K.S., kand.tekhn.nauk, retsenzent; MANYUKOV, G.S., inzh., red.; BOBROVA, Ye.N., tekhn.red.

[Problems concerning the organization of train movement] Voprosy organizatsii dvizheniia poezdov. Moskva, Vses.izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 211 p. (MIRA 14:6)

(Railroads--Traffic)
(Railroads--Signaling)

KOCHNEV, F.P., doktor tekhn.nauk, prof.

Some potentials of labor productivity in transportation. Trudy MIIT no.137:169-178 '61. (MIRA 15:1)
(Railroads--Labor productivity)

KOCHNEV, F.P., doktor tekhn.nauk, prof.

Expediency of using rail motorcars in suburban transportation. Elek. i tepl.tiaga 5 no.4:39-42 Ap '61. (MIRA 14:6)
(Railroad motorcars)

KOCHNEV, F.P., prof., doktor tekhn.nauk

Effectiveness of diesel trains and rail motorcars in suburban and local communications. Zhel.dor.transp. 43 no.2:37-40 F '61.
(Railroads—Commuting traffic) (Electric railroads)

KOCHNEV, Fedor Petrovich, prof., doktor tekhn.nauk; FUZIN, A.I., kand.tekhn.nauk, retsenzent; MANYUKOV, G.S., inzh., red.; VOROTNIKOVA, L.F., tekhn. red.

[Organizing the transportation of suburban passengers in railroad motorcars] Organizatsiia perevozok prigorodnykh passazhirov avtomotrisami. Moskva, Transzheldorizdat, 1962. 153 p. (MIRA 15:7)

(Railroad motorcars)

KOCHNEV, F.P., prof., doktor tekhn. nauk, zasluzhennyy deyatel' nauki i tekhniki

Locomotives and rolling stock used in commuter service should be better utilized. Elek. i tepl. tiaga 7 no.3:22-24 Mr '63. (MIRA 16:6)

(Railroads—Electrification)
(Railroads—Passenger traffic)

KOCHNEV, F. P., prof., doktor tekhn. nauk, zasluzhennyy deyatel' nauki i tekhniki RSFSR

Potentials of suburban train sheets. Zhel. dor. transp. 45 no.1:38-41 Ja '63. (MIRA 16:4)

(Railroads—Commuting traffic)

KOCHNEV, F.P., prof., doktor tekhn.nauk, zasluzhennyy deyatel' nauki i tekhniki RSFSR

Efficient methods for increasing the speed of passenger trains in local communications. Zhel.dor.transp. 45 no.9:42-45 S '63.

(MIRA 16:9)

(Railroads--Train speed)

KOCHNEV, F.P., doktor tekhn. nauk, prof.

Problems of the reduction of the costs of construction of new railroads. Trudy MIIT no.162:3 '63. (MIRA 17:4)

1. Rektor Moskovskogo instituta inzhenerov zheleznodorozhnogo transporta.

KOCHNEV, F.P., prof., doktor tekhn. nauk, red.

[Use of electronic digital computers in calculations connected with the operation of railroads.] Primenenie elektronnykh tsifrovykh vychislitel'nykh mashin v raschetakh, sviazannykh s ekspluatatsiei zheleznykh dorog. Moskva, Transport, 1965. 22? p. (Trudy Moskovskogo instituta inzhenerov zheleznodorozhnogo transporta, no.202). (MIRA 18:6)

1. Rektor Moskovskogo instituta inzhenerov zheleznodorozhnogo transporta.

KOCHNEV, Fedor Petrovich, zasl. deyatel' nauki i tekhniki RSFSR doktor tekhn. nauk prof.; DLUGACH, B.A., red.

[Weight and speed of passenger trains] Ves i skorost' passazhirskikh poezdov. Moskva, Transport, 1965. 275 p. (MIRA 19:1)

KOCHNEV, I. (Bodaybo, Irkutskaya obl.); ISHMAYEV, I. (Bodaybo, Irkutskaya obl.)

Under the conditions of northern regions. Posh. delo 8 no.9:25 S '62. (MIRA 16:11)

SIDOROVA, A.I.; KOCHNEV, I.N.

Changes in infrared absorption spectra of the brain tissue of a white rat dehydrated by vacuum pumping. Vest. LGU 19 no.16:38-41 '64.

(MIRA 17:11)

FOCHNEV, L.; VASIL'YEV, M.; FILATOV, S.

Neutralization of exhaust gases. Avt.transp. 40 no.1:19-21 Ja '62. (MIRA 15:1)

(Automobile exhaust gas)

[illegible], [illegible]

"Air Conditioning in Mining of Ore Deposits Disposed to Spontaneous Combustion." Sub [illegible] Mar 51, Inst of Mining, Acad Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.

APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723520010-1"

KOCHNEV, K. V.

KOCHNEV, K. V. -- "Control of Firedamp in Mining Deposits Susceptible to Self-Ignition." Sub 27 Jun 52, Inst of Mining, Acad Sci USSR (Dissertation for the Degree of Doctor in Technical Sciences)

SO: Vechernaya Moskva, January-December 1952

KOCHNEV, K. V.

USSR/Mining - Underground Fires, Mine Safety Jul 52

"Prevention of Endogenous Fires in Copper -Pyrite Mines," A. A. Ivanov, K. M. Charkviani, N. P. Diyev, K. V. Kochnev, Z. G. Sheina, Ye. F. Iordan, F. N. Pavlov

"Iz Ak Nauk, Otdel Tekh Nauk" No 7, pp 1037-1044

Presents results of works conducted since 1947 by a group of Soviet investigators studying causes of underground fires and establishing preventive measures. Discusses selection of mining system safe in respect to fires, silting as basic preventive measures against underground fires, and ventilation for cooling ore rocks and for maintaining normal temp conditions in mines. Submitted by Acad A. A. Skochinskiy 1 Apr 52.

PA 228T99

KOCHNEV, K.V.

Problem of fire damp leakage through caved ground in copper pyrite mines. Trudy Gor.-geol.inst. no.27:122-133 '55.
(MLRA 9:9)

(Mine ventilation)

KOCHNEV, K.V.

Computing mine ventilation in heated untouched ore blocks. Trudy Gor.-geol.inst. no.27:134-139 '55. (MLRA 9:9)

(Mine ventilation)

KOCHNEV, K.V., doktor tekhnicheskikh nauk.

Main trends in technical engineering studies on silicosis prevention in enterprises in the Urals. Sbor. rab. po sil. no.1:3-11 '56. (MIRA 10:2)

1. Gorno-Geologicheskiy institut Ural'skogo filiala Akademii nauk SSSR.
(LUNGS--DUST DISEASES) (URALS--MINE SANITATION)

KOCHNEV, K.V., koktor tekhnicheskikh nauk.

Technical means of preventing silicosis in Urals' mines. Gor.zhur. no.2:63-64 F '56. (MLRA 9:5)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR. (Ural Mountain region--Minners' phthisis) (Ural Mountain region --Mine sanitation)

BUTAKOV, Sergey Yefimovich; TALIYEV, V.N., kand.tekhn.nauk, retsenzent; KOCHNEV, K.V., doktor tekhn.nauk, red.; DUGINA, N.A., tekhn.red.

[Air ducts and ventilators; aerodynamics of ventilator equipment] Vozdukhoprovody i ventiliatory; aerodinamika ventiliatornykh ustanovok. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1958. 351 p. (MIRA 11:6)

(Ventilation)

KOCHNEV, K.V.

Industrial prevention of silicosis in the U.S.S.R. and in foreign countries. Trudy Gor.-geol. inst. UFAN SSSR no.31: 125-132 '58. (MIRA 12:9)
(MINE DUSTS) (MINERS--DISEASES AND HYGIENE)

KOCHNEV, K.V.; FILATOV, S.S.

Aerodynamics of flow in open-cut mining. Trudy Gor.-geol. inst. UFAN SSSR no.31:245-250 '58. (MIRA 12:9)
(Strip mining) (Mine ventialtion)

KOCHNEV, K.V.

Air conditioning in modern mines. Trudy Gor.-geol.inst.UFAN SSSR no.41:35-46 '59. (MIRA 13:5)
(Mine ventilation) (Air conditioning)

KOCHNEV, Konstantin Vasil'yevich; BUTAKOV, S.Ye., otv.red.; MAKOVSKIY, G.M., red.izd-va; ASTAF'YEVA, G.A., tekhn.red.

[Temperature control in mines] Teplovoe konditsionirovanie rudnichnogo vozdukha. Moskva, Izd-vo Akad.nauk SSSR, 1960. 133 p. (Akademiia nauk SSSR. Ural'skii filial, Sverdlovsk. Gorno-geologicheskii institut. Trudy, no.44) (MIRA 13:9)
(Mine ventilation)

KOCHNEV, K.V., prof., doktor tekhn.nauk; FILATOV, S.S., mladshiy nauchnyy sotrudnik

Improvement of atmospheric conditions in deep quarries. Sbor. rab. po silik. no.2:3-14 '60. (MIRA 14:3)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR.
(MINE VENTILATION) (MINE DUSTS)

KOCHNEV, K.V., prof., doktor tekhn.nauk; YEFREMOVA, T.K., gornyy inzhener

Controlling dust pollution of the air in mechanized longwall mining in the Chelyabinsk Coal Basin. Sbor. rab. po silik. no.2:125-129 '60. (MIRA 14:3)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR. (CHELYABINSK BASIN—DUST—PREVENTION)

FILATOV, S.S.; KOCHNEV, K.V.; VASIL'YEV, M.V.

Searching for practical methods of controlling exhaust gases from truck haulage in strip mines. Gor.zhur. no.5:65-68 My '60.
(MIRA 14:3)

1. Ural'skiy filial AN SSSR, Sverdlovsk.
(Mine sanitation) (Automobile exhaust gas)

D'YAKOV, Vasiliy Vasil'yevich; KOCHNEV, K.V., otv. red.; GRISHAYENKO, M.I., red. izd-va; SHKLYAR, S.Ya., tekhn. red.

[Dust control in scraper levels] Obespylivanie gorizontov skreperovaniia. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1961. 90 p. (MIRA 14:5)
(Mine dusts)

KOCHNEV, K.V., prof., doktor tekhn.nauk

Results of scientific studies on the technical prevention of sillicosis. Sbor. rab. po silik. no3:3-9 '61. (MIRA 15:10)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR.
(Mine dusts) (Lungs—Dust diseases)

KOCHNEV, K.V., prof., doktor tekhn.nauk; REZNIKOV, N.A., gornyy inzh.; FILATOV, S.S., gornyy inzh.

Controlling dust formation in the Korkino open-pit mine.
Sbor. rab. po silik. no.3:79-85 '61. (MIRA 15:10)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR, trest Korkinugol'.
(Chelyabinsk Basin—Coal mines and mining) (Mine dusts)

KOCHNEV, K.V., prof., doktor tekhn.nauk; SHEINA, Z.G., kand.khimicheskikh nauk; FEDOROVA, G.G., kand.khimicheskikh nauk

Preventing dust formation and keeping down floating dust in the Korkino open-pit mine. Sbor. rab. po silik. no.3:109-117 '61. (MIRA 15:10)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR. (Chelyabinsk Basin--Mine dusts)

KOCHNEV, K.V., prof., doktor tekhn.nauk; D'YAKOV, V.V., gornyy inzh.; KOVALEV, V.I., gornyy inzh.

Effect of the speed and initial dust content of an air current on its picking up dust from the surface of mine workings. Sbor. rab. po silik. no.3:119-128 '61. (MIRA 15:10)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR i Sverdlovskiy institut okhrany truda.

(Mine dusts)

KOCHNEV, K.V., prof., doktor tekhn.nauk; SHEINA, Z.G., kand.khim.nauk; FEDOROVA, G.O., kand.khim.nauk

Wetting agents and saline additives as means of controlling the process of dust prevention. Bor'ba s sil. 5:21-27 '62. (MIRA 16:5)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR. (Mine dusts—Prevention)

KOCHNEV, N.V., prof. doktor tekhn. nauk; [illegible], V.L., kand. tekhn. nauk; [illegible], V.I., kand. tekhn. nauk

Testing of electric mine filters. Bor'ba s sil. 6:164-167 '64 (MIRA 18:2)

KOCHNEV, N.

33206. KOCHNEV, N. Trud i presnya.-dva pokoleniya (ocherki ob ivan. tektil'schikakh ivanovskiy al'manakh, kn. 11, 1949, c. 1953

SO: Letopis' Zhurnal'nykh Statey, Vol. 45, Moskva 1949

H/3
917
.27K7

KOCHNEV, M

Zinaida Men'shikova. Moskva, Moskovskiy rabochiy, 1951

62 p. port.

APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723520010-1"

KOCHNEV, Mikhail

The fifth year of the seven-year plan. Av. i kosm. 45 no.1:2-5 Ja '63. (MIRA 16:1)

(Russia—Economic policy)

KOCHNEV, M.F.; GALYGIN, A.V.

Designing continuous pickling units. Metallurg 10 no.1:31-32 Ja '65. (MIRA 18:4)

1. Nachal'nik listoprokatnogo tsekha Magnitogorskogo metallurgicheskogo kombinata (for Kochnev). 2. Nachal'nik travil'nogo otdeleniya Magnitogorskogo metallurgicheskogo kombinata (for Galygin).

KOCHNEV M.F

137-58-6-12155

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 140 (USSR)

AUTHORS: Benyakovskiy, M.A., Shadrin, V.A., Kulikov, V.I., Uzivenko, A.M., Kustobayev, G.G., Kochnev, M.F., Kutuyev, Ya.S.

TITLE: The Interrelation of the Pressure, the Pull, and the Thickness of a Strip Subjected to Cold Rolling (Vzaimosvyaz' davleniya, natyazheniya i tolshchiny lenty pri kholodnoy prokatke)

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t chernykh metallov, 1957, Nr 3, pp 114-123

ABSTRACT: A three-stand rolling mill of the MMK was employed during research concerned with the effect of rolling (R) rate on the thickness of a strip (S), the establishment of interrelation of pressure and pull during cold R, and determination of the significance of longitudinal and transverse thickness variations in the S. A mathematical relationship is established between the basic parameters of the technological process of cold R of a S. It is established that variations in the tension of the strip midway between the stands of a mill have a decisive effect on the formation and magnitude of thickness variations in the S.

Card 1/2

137-58-6-12155

The Interrelation of the Pressure, the Pull, and the Thickness of a Strip (cont.)

Fluctuations of R rate at the MMK have practically no effect on the thickness of the S. Variations in the pull produce thickness variations in the S equivalent to 0.01-0.02 mm on the average.

S.N.

1. Steel--Processing 2. Steel--Pressure distribution 3. Rolling mills--Applications

Card 2/2

KOCHNEV, M.F.

BENYAKOVSKIY, M.A.; KULIKOV, V.I.; SHADRIN, V.A.; KOLPAKOV, I.P.; KUTUYEV, Ya.S.; KUSTOBAYEV, G.G.; KOCHNEV, N.F.; YESIPOV, I.V.; PETROV, B.I.

Power consumption for the deformation of metal and conditions of strip rollings. Stal' 17 no.1:59-63 Ja '57. (MIRA 10:3)

1. Ural'skiy institut chernykh metallov i Magnitogorskiy metallurgicheskiy kombinat.

(Rolling (Metalwork))

GUSEV, Vasiliy Fedorovich; KVITKO, M.N., inzh., retsenzent; KOCHNEV, M.G., inzh., retsenzent; BASHENTSYAN, A.A., inzh., red.; GORDEYEVA, L.P., tekhn.red.

[Assembly and adjustment of vertical propeller pumps] Montazh i naladka vertikal'nykh propellernykh nasosov. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 197 p. (MIRA 13:11)

(Pumping machinery)

TATARINOV, M.P., prof.; KOCHNEV, M.G., inzh.; CHESNOKOV, A.V., inzh.

New centrifugal mine pump. Nauch. trudy MGI no.23:209-216 '58. (MIRA 15:12)

(Mine pumps)

RABINOVICH, M.I.; KUNDZICH, M.M., inzh., retsenzent; KOCHNEV, M.G., inzh., red.; ZHURAVLEVA, M.N., red.izd-va; TIKHANOV, A.Ya., tekhn. red.

[Mobile pumping stations for irrigation]Peredvizhnye nasosnye stantsii dlia orosheniia. Moskva, Mashgiz, 1962. 115 p. (MIRA 16:3)

(Pumping stations) (Irrigation)

CA

Characterization of dust from roasters of Krasnouralsk Works. P. I. Devyagin and [illegible]. Tsvet. Metal. 1948, No. 7, 74-8.—Phys. and chem. analyses were made of the dust at various points of the dust-collector system of the Krasnouralsk Copper Works. The approx. compn. of the charge was: concentrate 100, quartz 26, returns 20, limestone 12, quartz with sulfides (35% SiO_2) 20 tons. The mass carried by the gases from the Cottrell precipitators is a material of −325 mesh. The sp. gr. of the dust varies from 3.03 to 3.87, and the analysis is: Cu 7.0-8.97, Zn 6.0-7.35, Fe 23.2-30.3 and S 10.0-14.0%. The Cu and Zn content in the fines is higher than their content in the entire mass; the S content, however, is highest in the coarsest fractions. The Fe content is about the same in all sizes. The following compds. of Cu were found: $CuSO_4$, CuO, Cu_2S, $CuFeS_2$. The $CuSO_4$ is the predominant Cu compd. and constitutes 45% of the Cottrell dust. The sulfate and oxides of Cu increase, and the sulfide content decreases in the direction of the gas motion. Considerable oxidation takes place in the Cottrell precipitator; the sulfides are caught better than oxides and sulfates. B. N. Daniloff

METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723520010-1"

KOCHNOV, M. I.

M. I. Kochnov, Examination of abnormal sectors of the logarithmic curves of the dissociation pressure of cobalt arsenides. P. 1210

This work is devoted to the study of the dissociation pressure of cobalt arsenides. This investigation was preceded by the study of ignition temperatures of cobalt arsenides by heating them in a stream of air. This work is to augment the characteristics of arsenides by studying their behavior in a neutral atmosphere near their ignition temperature and on the given dissociation pressure to characterise the cobalt arsenides thermodynamically.

Chair of Metallurgy of Heavy Non-Ferrous Metals of the Ural Industrial Institute, March 22, 1948

SO: Journal of Applied Chemistry (USSR) 21, No. 12 (1948)

KOCHNEV, M. I.

PA 11/49T15

USSR/Chemistry - Silicon Oxide — Aug 48
Chemistry - Vapor Pressure

"Vapor Tension of Silicon Oxide," P. V. Gel'd, M. I. Kochnev, Ural Ind Inst imeni S. M. Kirov, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 4

Studies vapor pressure of silicon dioxide between 900° and 1100° C. Tabulates results. Independence of SiO vapor tension of its degree of volatilization shows that solid state is a separated phase, and not a solid solution. Submitted 15 May 48.

11/49T15

2

CA

Free-energy and heat-content changes in the reactions of formation of cobalt arsenides. M. I. [illegible]. Zhur. Priklad. Khim. (J. Applied Chem.) 22, [illegible] (1949).—(1) Ignition temps. and As vapor pressures (at a temp. close to the ignition temp.), in mm. Hg, were detd. for the following arsenides: $CoAs_3$, 540°, [illegible] × 10^{-2} ([illegible]°); $CoAs_2$, 610°, 1.44 × 10^{-2} (615°); Co_2As_3, 770°, [illegible] × 10^{-1} (765°); $CoAs$, 765°, 6.57 × 10^{-2} (775°); Co_3As_2, 780°, 5.88 × 10^{-1} (787°); Co_2As, 850°, [illegible] × 10^{-1} (785°). (2) For the formation reaction 3 Co (cryst.) + $^1/_2$ As_4 (gas) → Co_3As_2 (cryst.), from the dissocn. vapor pressure, the free energy of formation at 785° is ΔF = −17,477 cal./mole, the heat (between [illegible] and 785°) ΔH = −41,240 cal./mole, and the entropy change at 785°, ΔS = −22.18 cal./mole/degree. The change of the dissocn. equil. const. K_p = $p_{As_4}^{1/2}$ (atm.), between [illegible] and 785°, is satisfactorily rendered by log K_p = (9012/T) − 4.840. For fused Co_3As_2, the dissocn. vapor pressure between 950 and 1050° is rendered by log p (atm.) = (18034/T) − [illegible]; hence, for the formation at 950°, ΔF = −17,[illegible], and ΔH = −[illegible] cal./mole. Actually, the products of dissocn. are partially dissolved in the original Co_3As_2, resulting in a liquid phase of variable compn.; consequently, the vapor-pressure formula has only an approx. validity. (3) For the reaction 3 Co_2As (cryst.) + $^1/_4$ As_4 (gas) → 2 Co_3As_2 (cryst.), K_p = $p_{As_4}^{-1/4}$, at 787°, ΔF = −[illegible] cal. = −1734 cal./mole Co_2As, and ΔH = −20,[illegible] cal. = −4133 cal./mole Co_2As; at the melting temp. of Co_2As, [illegible]°, ΔF = −[illegible] cal. = −1298 cal./mole Co_2As, and ΔH = −18,[illegible] cal. = −[illegible] cal./mole Co_2As. Between [illegible] and 787°, log K_p = ([illegible]/T) − [illegible]. From the data for the foregoing 2 formation reactions, it is calcd. for 2 Co (cryst.) + $^1/_4$ As_4 (gas) → Co_2As (cryst.), at 787°, ΔF = −[illegible], ΔH = −[illegible] cal./mole. (4) For 2 CoAs (cryst.) + $^1/_4$ As_4 (gas) → Co_2As_3, K_p = $p_{As_4}^{-1/4}$, at 775°, ΔF = −[illegible] cal. = −[illegible] cal./mole Co_2As_3, ΔH = −21,[illegible] cal. = −[illegible] cal./mole Co_2As_3; at the melting temp. of Co_2As_3, 1014°, ΔF = −[illegible] cal. = −[illegible] cal./mole Co_2As_3, ΔH = −[illegible] cal. = 11,[illegible] cal./mole Co_2As_3. Between [illegible] and 775°, log K_p = ([illegible]/T) − [illegible], between [illegible] and [illegible]°, log K_p = ([illegible]/T) − 1.[illegible], and between [illegible] and [illegible]°, log K_p = ([illegible]/T) − 1.[illegible]. Hence, for 2 Co (cryst.) + $^1/_2$ As_4 (gas) → Co_2As_3 (cryst.), at 775°, ΔF = −17,[illegible], ΔH = −41,[illegible] cal./mole Co_2As_3. (5) For Co_2As_3 (cryst.) + $^1/_4$ As_4 (gas) → 2 CoAs (cryst.), K_p = $p_{As_4}^{-1/4}$, at 765°, ΔF = −[illegible] cal. = −[illegible] cal./mole CoAs; ΔH = −20,787 cal. = −[illegible] cal./mole CoAs; in the temp. ranges 740–765, 765–[illegible], and [illegible]–1050°, log K_p = ([illegible]/T) − [illegible], ([illegible]/T) − 2.[illegible], and ([illegible]/T) − [illegible], resp. For the formation from the elements, Co (cryst.) + $^1/_4$ As_4 (gas) → CoAs (cryst.), at 765°, ΔF = −[illegible], ΔH = −[illegible] cal./mole CoAs. (6) For 2 CoAs (cryst.) + $^1/_4$ As_4 (gas) → $CoAs_2$ (cryst.), K_p = $p_{As_4}^{-1/4}$, at [illegible]°, ΔF = −[illegible], ΔH = −[illegible] cal./mole $CoAs_2$; between [illegible] and 765°, log K_p = ([illegible]/T) − 2.474. For the formation from the elements, Co (cryst.) + $^1/_2$ As_4 (gas) → $CoAs_2$ (cryst.), at 765°, ΔF = −[illegible], ΔH = −[illegible] cal./mole $CoAs_2$. (7) For $CoAs_2$ (cryst.) + $^1/_4$ As_4 (gas) → [illegible] $CoAs_3$ (cryst.), K_p = $p_{As_4}^{-1/4}$, at 540°, ΔF = −[illegible] cal. = −[illegible] cal./mole

$CoAs_2$. ΔH = −16,730 cal. = −8375 cal./mole $CoAs_2$; between 400 and 520° and 540–663°, log K_p = (3128/T) −1.837 and (8000/T) − 2.168, resp. Dissoc. pressure calcd. by the 2nd equation in the 2nd temp. range coincide with data obtained by mol. effusion, and agree with the pressure of 740.9 mm. Hg detd. by heating $CoAs_2$ in a stream of N_2 at 873°. For the formation from the elements, Co (cryst.) + ½ As_4 (gas) → $CoAs_2$ (cryst.), at 730°, are found ΔF = −12,[illegible], ΔH = −37,[illegible] cal./mole $CoAs_2$. (7) Values of ΔF and ΔH of formation from the elements, at 730°, per 1 g.-atom Co, are: $CoAs_3$ −3736 and −[illegible]; [illegible] −[illegible] and −10,314; [illegible] −6115 and −12,[illegible]; [illegible] −[illegible] and −20,760; [illegible] −11,[illegible] and −[illegible]; [illegible] −12,300 and −37,[illegible] cal./Co. In the same order, ΔF and ΔH per 1 g.-atom As, are: −[illegible] and −[illegible]; −[illegible] and −[illegible]; −9173 and −[illegible]; −[illegible] and −[illegible]; −7643 and −10,410; −6469 and −13,700 cal./As. At 1014°, the values are, per 1 g.-atom Co, for [illegible] −3288 and −7[illegible]; [illegible] −[illegible] and −9136; [illegible] −[illegible] and −12,[illegible] cal./Co. In the same order, per 1 g.-atom As, −7384 and −13,[illegible]; −7075 and −13,354; −7389 and −10,316 cal./As. Thus, at the same temp., ΔF and ΔH per 1 g.-atom Co increase regularly from lower to higher arsenides.

N. Thon

KOCHNEV, M. I.

Methods of preparing arsenides of exact composition. M. I. Kochnev (*J. Appl. Chem. U.S.S.R.* 1950, 23, 561 [illegible]). [illegible]
As is obtained from pure As_2O_3 by reduction with charcoal in an
atm. of H_2. Co is obtained by reduction of $CoCl_2$ with H_2, and Ni
or Fe by reduction of its oxide; electrolytic Cu is used. The
powdered metal and As are mixed in stoichiometric proportions
in a porcelain crucible. The crucible is placed inside a horizontal
quartz tube inside a tubular electric furnace. Air is displaced by
H_2 and the temp. is kept above the m.p. of the arsenide. Inside
the quartz tube As vapours concentrate in the lower part, while
the upper part of the tube is filled with H_2. The molten metal
reacts quickly with vapours of As and the whole synthesis is com-
pleted within 1 hr. Co_2As, Co_5As_2, Co_3As_2, CoAs, Ni_5As_2, Ni_3As_2,
Ni_2As_3, Cu_3As, Cu_5As_2, and Fe_2As obtained in this way do not differ
from their theoretical composition by more than 0.05%. To
obtain higher arsenides it is necessary to maintain the temp. above
the m.p. of As in hermetically closed, steel, pressure vessels, lined
with a mixture obtained from Fe_2O_3, Al_2O_3, and Fe powder wetted
with water-glass and calcined at 930°. The products obtained in
pressure cylinders have an As content slightly higher than theoretical;
this excess can be removed by heating in vac. at 400–500° in an
ampoule with a small opening. J. H. J. Zaks.

BC

A-1

6

CA

6

Methods of preparing arsenides of definite composition. M. I. Kozhukhov. J. Applied Chem. U.S.S.R. 23, 303-609 (1950) (Engl. translation).—See C.A. 44, 7007d R. M. S.

1952

KOCHNEV, M.I.

1

"The Thermodynamic Properties of the Cobalt Arsenides. M. I. Kochnev (Doklady Akad. Nauk S.S.S.R., 1950, 70, (3), 433–435).—(In Russian). The thermal dissociation of the Co arsenides was studied by measuring the pressure of the liberated As vapour by the method of flow. Synthetic $CoAs_3$, $CoAs_2$, CoAs, Co_2As, and Co_3As_2 were studied, and equations for their dissociation are given. Temp. of experiment ranging from 460° to 1001° C. were used, depending on the temp. of the arsenide. The mol. of gaseous arsenic was assumed to be As_4, and as the dissociation pressure of the arsenides in the given temp. interval was very low, the ideal gas laws were assumed to be applicable. The dissociation pressures of the six Co arsenides at >7° C. from their ignition temp. are given, and the equilibrium const. of the dissociation reactions are calculated from them. The heats of formation of the Co arsenides and their heats of dissociation are also calculated. Solubility of the dissociation products in the Co arsenides affects the results slightly. Empirical equations for the dependence of the equilibrium const. on temp. are given.—Z. S. B.

KOCHNEV, M. I.

Solid solutions of the system cobalt-arsenic. M. I. Kochnev. *Doklady Akad. Nauk S.S.S.R.* 71, 1107-8(1950).—Mixts. of Co-As in the range of 44-70% Co were investigated by the method of ignition temps. Plots of ignition temps. vs. % As yield 4 peaks corresponding to the arsenides, each with a higher ignition temp. as the % As increases. The expected horizontal temp. lines between the arsenides and the stepwise rise does not appear. The temp. drops abruptly from each max., becomes horizontal and then rises to the ignition temp. of the subsequent arsenide. This is explained on the assumption that solid solns. of limited soly. are formed; the following approx. compn. is given:

$CoAs$ + 46.4% Co; Co_5As_4 + 51-53.2% Co; Co_3As_2 + 55.5-61.8% Co; Co_5As_2 + 64.6-67.8% Co. I. B.

10-13-54

3

*Dissociation Pressure of Copper Arsenide. M. I. Kochnev (*Doklady Akad. Nauk S.S.S.R.*, 1951, 78, (3), [illegible].—(In Russian). The dissociation pressure (P) of an alloy contg. 71·40% Cu, 28·60% As (Cu_3As contains 28·23% As) was measured over the range 505°–700° C. by the molecular-flow method used previously for cobalt arsenide (*Zhur. Priklad. Khim.*, 1948, 18, 1210; preceding column). Over the range 505°–590° C., log $P \propto 1/T$, where T is the abs. temp., but in the interval 590°–595° C. P drops sharply, and at 600° C. it could not be measured. Beginning at 605° C., however, P again increases with temp., so that at 665° C. it has reached the value it had at 590° C. By 700° C., P has begun to fall gradually. Comparison of the log P vs. $1/T$ curve with the equilibrium diagram shows that anomalies in the curve correspond to temp. of isothermal transformations in alloys with compn. near to Cu_3As. Over the temp. range 500°–590° C., the equilibrium const. K_p for the formation of Cu_3As from the elements was given by: $\log K_p = \frac{2190}{T} - 1·25$. The free energy of formation at 590° C. $\Delta\Phi_{863} = -6472$ cal./g.-mol. For the interval 505°–590° C., the change in heat content $\Delta H = -11,305$ cal./g.-mol., and the change in entropy $\Delta S = -5·7$ cal./g.-mol. The value of [illegible],000 cal./g.-mol. for the heat of formation obtained by Savelsberg (*Metall u. Erz*, 1936, 14, 279) is criticized.

—G. V. E. T.

KOCHNEV, M. I. 262T23

USSR/Metallurgy - Nickel Ores, Smelting Aug 52

"Effect of the Oxides of Alkali Metals on the Viscosity of High-Magnesium Slags," N. P. Diyev, M. I. Kochnev, M. F. Kochin, Yu. A. Gyrdymov

Iz Ak Nauk SSSR, OTN, No 8, pp 1182-1188

Discusses exptl smelting of Ni ores for obtaining complete characteristic of compn and properties of slags. Establishes that slags with 10-12% FeO and 17-19% MgO are extremely difficult to melt and have high viscosity. Presence of alkali metal oxides in amount of 1.5-2.0% reduces high fusibility and viscosity of these slags, promoting their removal

262T23

from furnace. Such favorable effect of oxides takes place only when total content of silica and alumina does not surpass approx 52%. Presented by Acad I. P. Bardin 28 Oct 51.

The structure of copper scale and the mechanism for the oxidation of copper. V. P. Il'in and M. I. Kochnev. *Doklady Akad. Nauk S.S.S.R.* 85, 561-6(1952).—Based on the literature data, a mechanism is proposed for the oxidation of Cu based on the diffusion of O through the crystal lattice. The thickness of the Cu_2O layer increases in two directions: on the boundary $Cu-Cu_2O$ and on the boundary Cu_2O-CuO. J. Rovtar Leach

KOCHNEV, M.I.; ZAYTMAN, T.I.

Characteristics of variation in the physico-chemical properties of copper selenide. Izv.AN SSSR Otd.tekh.nauk no.12:1813-1818 D '53. (MLRA 7:2)

1. Predstavleno akademikom I.P.Bardinym. (Copper compounds)

KOCH[illegible], M. I.

Chemical Abstracts
May 25, 1954
General and Physical
Chemistry

Oxidation of seleniferous copper. N. P. Diev, M. I. Kochnev, A. P. Plotnikova, and I. N. Zal[illegible]. Zhur. Priklad. Khim. 26, 705-712(1953).—The kinetics of oxida-
tion of Cu contg. 0, 0.44, 1.77, and 2.47% Cu was investi-
gated. The rate of oxidation between 600 and 1000° in-
creases with Se content, although between 800 and 900°
the rate is lower than for pure Cu. The rate-time curves
are parabolic. After 1.5 hrs. at 1000°, Se content drops
from 2.47 to 2.27% in the metal and to 0.066% in the oxide
scale. Adding Ag, as in 1.37% Se-1.24% Ag triple alloy,
increases the rate of oxidation. This is of interest in fire re-
fining of Cu.

B. H. Elkin

KOCHNEV, M.I.

DIYEV, Nikolay Pavlovich; VERMENICHEV, Sergey Aleksandrovich; PEN'KO, Aleksandr Stepanovich. ~~KOCHNEV, M.I., redaktor~~; LUCHKO, Yu.V., redaktor; KOVALENKO, N.I., tekhnicheskiy redaktor

[Smelting copper ores and concentrates in reverberatory furnaces] Otrazhatel'naia plavka mednykh rud i kontsentratov; uchebnoe posobie dlia shkol i kursov masterov. Sverdlovsk, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1954. 300 p. (MIRA 8:4)
(Copper--Metallurgy) (Smelting furnaces)

KOCHNEV, M.I.

Sulfation of manganese dioxide with ferrous sulfate and with pyrite. [illegible], V. V. [illegible] and O. Ya. [illegible]. J. Appl. Chem. [illegible] (1954) (Engl. translation).—See C. A. 48, 11[illegible]

H. L. H.

CH

KOCHNEV, M. I.

AID - P-86

Subject : USSR/Chemistry

Card : 1/1

Authors : Diyev, N. P., Kochnev, M. I., Paduchev, V. V., and Sioridze, G. Ya.

Title : Formation of manganese sulfate from manganese dioxide by ferrous sulfate or pyrite

Periodical : Zhur. Prikl. Khim. 27, no. 4, 356-359, 1954

Abstract : Roasting of manganese dioxide with ferrous sulfate at [illegible] converts 98-99% manganese into sulfate; with pyrite, 87.5-89% Mn. Three references (U.S.S.R.): 1935-1944. Three graphs; three tables.

Institution : None

Submitted : February 16, 1953

APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723520010-1"

Characteristics of iron oxide dissociation. M. I. Kochnev, E. V. [illegible], D. A. [illegible], and N. N. Serebrennikov. *Trudy Ural. Politekh. Inst.* 1954, No. 49, 163-7; *Referat. Zhur., Khim.* 1954, No. 45828.—Partial pressure of O (P_O) of Fe_2O_3 was detd. at 800-1350°. In the region of small pressures (up to 1100°) the method of mol. efflux was used, in which samples of chemically pure Fe_2O_3 were placed in quartz ampuls and were degassed for 1-4 hrs. in vacuo at 600-800°. For temps. above 1150° P_O was detd. manometrically, porcelain app. being used. In the interval 1100-1420° $\log P_O = (-32{,}406/T) + 6.10$ and for temps. of 920-1100° $\log P_O = (-14{,}882/T) + 1.90$. The thermal effects of the reaction for the above are 148,290 and 68,084 cal./mole. At temps. 830 and 880-900° deviations from the above relations were observed; at these temps. P_O exceeds the calcd. values 100-300 times. The points of anomalous behavior correspond to transformation of Fe_2O_3. At 930° the red modification of Fe_2O_3 changes to black and at 817° α Fe_2O_3 changes to γ Fe_2O_3. M. Hosch

3

M PM

Kochnev, M I.

The relation between the changes in dissociation pressure and the electrical resistance of cobalt arsenide. M. I. Kochnev. Doklady Akad. Nauk S.S.S.R. 105, [illegible] ([illegible]).—The quant. relation between the elec. and physicochem. properties of semiconductors, such as $CoAs_2$, was studied by a comparison of vapor dissoc. pressure and the elec. cond. between 200 and 850°. The curves are similar in shape, with 2 max. near 465 and 800°. The 465° max. is related to the transformation in the Co-As system at 465°. The 800° max. is explained by the transition of the cubic lattice into the hexagonal [illegible] modification. W. M. S.

AGLITSKIY, Viktor Aleksandrovich; KOCHNEV, M.I., redaktor; KEL'NIK, V.P., redaktor izdatel'stva; KOVALENKO, N.I., tekhnicheskiy redaktor

[The manufacture of copper wire bars; theory and practice] Proizvodstvo mednykh vaierbarsov; teoriia i praktika. Sverdlovsk, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1956. 287 p. (MIRA 9:10)
(Wire) (Copper--Metallurgy)

USSR/ Cosmochemistry. Geochemistry. Hydrochemistry D.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11520

Author : Zaydman T.N., Kochnev M.I., Plekhanov A.F.
Inst : Department of Technical Sciences, Academy of Sciences USSR
Title : On Reactivity and Thermal Transformations of Sphalerite

Orig Pub : Izv. AN SSSR, Otd. tekhn. n., 1956, No 6, 168-171

Abstract : Investigated was the dependence of heating rate of a specimen of sphalerite on the temperature at a constant flow of heat. Chemical composition of specimen (in %): Zn 6$.15, S 32.25, Pb 0.42, Fe 0.78. Correlation between rate of heating (τ degree/minute and temperature is represented by a graph which is of the nature of sudden changes with a gradual subsidence on increase in temperature to 650°. The curve shows two sharply manifested maxima (at 650 and 950°) and two minima (at 850 and 1020°), after which the curve extends upward. Anomalous progression course of the graph is due to the occurence of a number of thermal transformations associated with changes in state of crystal lattice. A correlation has been ascertained between intervals of thermal transformations of ZnS and temperature of critical points of the forming elements.

1/1

VOLKOVA, P.I.; DIYEV, N.P.; KOCHNEV, M.I.

Phase composition of copper-zinc mattes. TSvet.met. 29 no.1: 47-50 Ja '56. (MIRA 9:6)
(Copper--Metallurgy) (Zinc--Metallurgy)

SOV/137-58-10-21303

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 123 (USSR)

AUTHORS: Zalazinskiy, G.G., Diyev, N.P., Kochnev, M.I.

TITLE: On the Kinetics and the Mechanism of Oxidation of a Copper-nickel Alloy at Elevated Temperatures (O kinetike i mekhanizme okisleniya medno-nikelevogo splava pri vysokikh temperaturakh)

PERIODICAL: Tr. in-ta metallurgii. Ural'skiy fil. AN SSSR, 1957, Nr 1, pp 59-64

ABSTRACT: The kinetics of oxidation (O) of a Cu-Ni alloy (I) in the process of multiple heating and the diffusion of O_2 in I were investigated, and comparative data on the oxidation in air and in O_2 were determined. Attempts to establish selective diffusion of Cu and Ni in the process of 30 hours' O of I containing 4.1% Ni were unsuccessful. The rate of diffusion of O_2 in I in the process of its O at 1000°C in air is higher than the rate of the growth of the scale, as the result of which I becomes saturated with O_2. The rate of O of I quickly increases with the saturation of its entire mass with O_2. The rate of O of I in either air or O_2 in the 700 - 1000° temperature range increases ~ 2.2 times with a 100° increase in temperature. The rate of O of I in O_2 is on

Card 1/2

SOV/137-58-10-21303

On the Kinetics and the Mechanism of Oxidation (cont.)

the average 1.56 times higher than in air. The rate of O of I in air at 700 - 800° is lower than the rate of O of electrolytic Cu, whereas at 900 - 1000° it is higher than that of pure Cu.

N. L.

1. Copper-nickel alloys--Oxidation 2. Copper-nickel alloys--Temperature factors 3. Copper--Diffusion 4. Nickel--Diffusion

Card 2/2

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 53 (USSR) SOV/137-58-12-24303

AUTHORS: Volkova, P. I., Diyev, N. P., Kochnev, M. I.

TITLE: The Behavior of Zinc Compounds When Matte is Allowed to Stand (Povedeniye soyedineniy tsinka pri otstaivanii shteynov)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1957, Nr 1, pp 87-92

ABSTRACT: A Kryptol furnace and alundum crucibles are used under laboratory conditions to run experiments in which Cu mattes containing ~25% Cu and various amounts of Zn are allowed to stand. It is established that up to ~8% of the ZnS in a melt of Cu matte at 1140°C is in solution. If the ZnS content is higher, the excess is in the form of a ZnS-enriched sphalerite solid solution, which rises to the surface when the matte bath is allowed to stand and forms a thick viscous mass that complicates separation of the matte and the slag. The $ZnOFe_2O_3 + FeS = ZnS + Fe_3O_4$ reaction occurring in the melts causes the bulk of the Zn ferrite to convert to ZnS when allowed to stand for a long period. The magnetite is concentrated by segregation in the lower portion of the matte ingot, and also in its upper portion, which

Card 1/2

is of elevated viscosity when allowed to stand. Small amounts of SiO_2 and Al_2O_3 found in matte melts do not precipitate.

Ye. Z.

Card 2/2

SOV/137-58-12-24300

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12, p 53 (USSR)

AUTHORS: Volkova, P. I., Diyev, N. P., Kochnev, M. I.

TITLE: Reaction Between Zinc Matte and Metallic Iron (Vzaimodeystviye mezhdu tsinkovistym shteynom i metallicheskim zhelezom)

PERIODICAL: Tr. In-ta metallurgii. Ural'skiy fil. AN SSSR, 1957, Nr 1, pp 93-98

ABSTRACT: The reaction between ZnS and metallic Fe in the 600-1300°C temperature range is studied. The thermodynamic calculation of the isobar potential is studied. It shows that the probability that the reaction would occur rises with temperature. A study is made of the rate of reaction between Zn matte and metallic Fe. It is established that: 1) The quantity of Zn removed in the process at a given Fe content rises with temperature; 2) the reaction between the solid phases occurs in the first 20 min, after which it ceases; 3) when the Fe content in the specimen is low and the temperature is 1000°, the reaction between Zn matte and Fe hardly occurs at all; 4) the marked change in the isobar potential of the reaction between ZnS and metallic Fe at 900° corresponds to the maximum Zn removal

Card 1/2

SOV/137-58-12-24300

Reaction Between Zinc Matte and Metallic Iron

established by kinetic investigations.

L. S.

Card 2/2

SOV/137-58-7-14554

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 87 (USSR)

AUTHORS: Skornyakov, G.P., Motova, Z.A., Kochnev, M.I.

TITLE: Luminosity of Converter Flame During the Fining of Blister Copper (O svechenii plameni konvertera v period dovodki chernovoy medi)

PERIODICAL: Byul. tsvetn. metallurgii. 1957, Nr 24, pp 20-22

ABSTRACT: A photometric study was conducted of the converter flame (by spectroscope connected to a film camera), and optical monitoring by photoelectric pyrometer with recording potentiometer was performed. In both cases, intensity of emission was found to increase during the fining period, this being connected with an increase in the Cu contents of the melt. Maximum emission of light was attained during the final 5 to 8 min. The subsequent sharp drop is apparently to be explained by the onset of Cu oxidation.

L.P.

1. Flames--Spectographic analysis 2. Photometry--Applications 3. Photoelectric pyrometers--Applications 4. Copper --Properties

Card 1/1

KOCHNEV, M.I.

24-58-3-9/38

AUTHORS: Kochnev, M.I., Plotnikova, A.F. and Starkov, L.N. (Sverdlovsk).

TITLE: Temperature Features of the Process of Oxidation of Copper Sulphide (Temperaturnyye osobennosti protsessa okisleniya sul'fida medi)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 82-88 (USSR)

ABSTRACT: Modern conceptions on the changes in the electron structure of atoms and their influence on the character of the chemical bond forces, gained from the study of semi-conductors, justify a more thorough analysis of various phenomena involved in metallurgical processes. In earlier work in this field, relating to compounds of heavy non-ferrous metals, the team of the authors of this paper established the existence of a temperature correspondence in the changes of the properties of these compounds and of their components. The aim of the work described in this paper was to study the inter-relation between the temperature changes and the properties of copper and sulphur and the properties of the simple compound Cu_2S formed from these. Cu_2S was chosen for investigation due to the fact that it is one of the basic components of the raw materials for which new processes of roasting and smelting are being developed. Two specimens were investigat-

Card 1/4

24-58-3-9/38

Temperature Features of the Process of Oxidation of Copper Sulphide.

ed which were prepared synthetically by smelting, the respective compositions being the following: 78.9% Cu, 21.1% S and 79.1% Cu, 20.9% S (the theoretical composition being 79.8% Cu, 20.2% S). In both cases the composition was in the range of solid solutions of sulphur in Cu_2S. The differences in the composition of the two specimens proved to be of little importance. The experiments were carried out mainly with sulphide grains of the sizes 0.50 to 0.63 mm. Oxidation of the sulphide was carried out in a vacuum set-up, a sketch of which is shown in Fig.1, p.83, using the method of circulating air in a closed system, drawing it through a layer of the charge which is heated to a certain temperature; the gases obtained after drawing off the air through the charge were caught by a device in which cooling by means of liquid nitrogen was applied for the purpose of freezing out sulphurous acid anhydride and sulphuric anhydride. According to Averbukh, B.D. (Ref.7) the quantity of forming sulphuric anhydride under these conditions is very low and, therefore, was not determined separately. The investigations were carried out with a constant initial air pressure in the system

Card 2/4

24-58-3-9/38

Temperature Features of the Process of Oxidation of Copper Sulphide.

of 408 mm and a constant temperature of the charge, which were established during each measurement of oxygen consumption after three minutes. The total duration of the experiment was 21 or 30 mins. The graph, Fig.2, gives the change in the speed of oxidation of Cu_2S during continuous heating. The graph, Fig.3, gives the temperature dependence of the coefficient of electrical resistance of the copper. The graph, Fig.4, gives the temperature dependence of the oxidation speed of copper sulphide along a fresh surface. The graph, Fig.5, gives the temperature dependence of the quantity of copper which is present in the form of oxides and sulphate in the residue on the degree of oxidation of Cu_2S.

In Fig.6 the consumption of oxygen and the yield of sulphurous acid anhydride as a function of the temperature are graphed. It was established that the speed of oxidation of Cu_2S does not change continuously with temperature but is complicated by a number of anomalous deviations within narrow temperature ranges. The temperatures of the narrow deviations in the kinetics of oxidation of copper sulphide are critical temperatures for pure copper and pure sulphur, the manifestation of which is considered as being the result

Card 3/4

24-58-3-9/38

Temperature Features of the Process of Oxidation of Copper Sulphide.

of changes in the electron structures of the atoms with increasing temperature. The character of the changes in the speeds of oxidation of the copper sulphide at critical temperatures is elucidated and the limits of anomalous temperature ranges were determined; in most cases the sharp fluctuations in the oxidation speed reach 20 to 30% and take place in the temperature range 5 to 15°C. On the basis of study of the oxidation isotherms, the degree of utilisation of the oxygen and the yield of sulphurous acid anhydride and of the influence of the oxidation duration, the conclusion is arrived at that the determining factor in the process of oxidation of Cu_2S at temperatures up to 450°C is the formation of sulphate. There are 6 figures and 12 references, 11 of which are Soviet, 1 English.

ASSOCIATION: Institut metallurgii Ural'skogo filiala, AN SSSR (Institute of Metallurgy, Ural Branch Ac.Sc., USSR)

SUBMITTED: January 3, 1957.

Card 4/4 1. Copper sulfide--Oxidation 2. Temperature--Effects

Kretinev, M.I.

Akademiya nauk SSSR. Ural'skiy filial. Institut metallurgii

Trudy, Vyp. 4 (Transactions of the Institute of Metallurgy, Ural Branch, Academy of Sciences, USSR; No. 4) Sverdlovsk, 1958. 177 p. Errata slip inserted. 1,000 copies printed.

Editorial Board: N.A. Vatolin (Resp. Ed.), Candidate of Technical Sciences; A.N. [illegible], Professor, Doctor; V.Ya. Miller, Professor; P.A. Pazdnikov, Candidate of Technical Sciences; and S.A. [illegible], Candidate of Technical Sciences; Ed.: N.S. [illegible].

PURPOSE: This book is intended for ferrous and nonferrous metallurgists.

COVERAGE: The book presents results of investigations of theoretical problems in metallurgy and chemistry and gives information on the efficient use of raw materials in ferrous and nonferrous metallurgy and on the development of new production processes in the metallurgical and chemical industries. The articles were written by junior workers and experimental specialists of the scientific staff of the Institute of Metallurgy, Chemistry, and Electrochemistry, Ural Branch, Academy of Sciences, USSR.

[illegible]. Electrical Resistance and Phase Composition of [illegible] During the Reducing-Smelting Process 15

[illegible]. On the Connection Between the Kinetics of the Vaporization of [illegible] and the Pressure of Saturated Vapor 19

[illegible]. Behavior of [illegible] During the Roasting of Sulfide [illegible] 23

[illegible]. On the Reduction of the Lower Sulfides of Nickel and Cobalt 25

[illegible]. Oxidation of the Lower Sulfides of Nickel and Cobalt 29

[illegible]. Polarization of Beryllium-Oxide-Carbon [illegible] in Fused Chlorides 46

[illegible]. Investigation of the Conditions for Electrodeposition of Copper From Sulfate Solutions in the Presence of Iron, Zinc, and Cadmium Cations and the Nitrate Anion 51

[illegible]. Some Prerequisites for the Electrolytic Production of Lead Sponge From Alkaline Chloride Solutions and Selection of Insoluble Anodes for Electrolysis 59

[illegible]. Some Peculiarities of the Reaction of Bauxite With Soda and Lime During the Sintering Process 67

[illegible]. Optimum Conditions for Leaching Soda-Bauxite Sinter Cakes 73

[illegible]. Production of Metallic Sodium by [illegible] Reduction of the Sulfate or Carbonate (Exploratory Tests) 77

[illegible]. On the Problem of Passage of [illegible] to the Gaseous Phase During Air Blast 81

[illegible]. Comparative Data on the Carrying of Liquid Into the [illegible] Tubes in an Experimental Converter 87

[illegible]. On the Behavior of Oxides of [illegible] During the Metallurgical Treatment of [illegible] Ores 97

[illegible]. On the Melting and Overheating of Pig Iron in the Cupola 102

[illegible], A.V., and V.P. [illegible]. Change in Chemical Composition and [illegible] Content of Pig Iron During Cupola Melting 107

[illegible]. Phosphorus and Titanium in Foundry Pig Iron 113

[illegible]. On the Deposition of [illegible] 119

[illegible]. Investigation of the Copolymers of [illegible] and Styrene 127

[illegible]. Production of Isoparaffins by Alkylation of [illegible] With Olefins 133

[illegible]. [illegible] Properties of [illegible] 144

SOV/24-58-4-22/39

AUTHORS: Kochnev, M.I. and Plotnikova, A.F. (Sverdlovsk)

TITLE: Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place (Kinetika vosstanovleniya magnitnogo zheleznyaka pri temperaturakh prevrashcheniy zheleza)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 4, pp 118 - 121 (USSR)

ABSTRACT: In earlier work one of the authors of the paper found that there is a direct relation and a temperature correspondence between the changes taking place in various metal compounds and the changes in the properties of the individual elements forming these compounds. In this paper, the authors aimed at verifying this conclusion for iron oxides and thus to try and explain anomalous phenomena taking place in reduction processes. To bring the theoretical investigations nearer to industrially used materials, the authors used in the experiments magnetite and not pure oxides. The composition of the ore was as follows: 51.1% Fe, 22.9% FeO, 0.18% MnO, 12.0% MgO, 0.55% CaO, 1.74% Al_2O_3, 9.4% SiO_2, 2.6% S, 0.05% Cu. The kinetics of

Card1/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

reduction were investigated on a circular vacuum test rig (described in an earlier paper) (Ref 20) inside a hydrogen atmosphere; the initial pressure was 408 mm, hydrogen was sucked through a layer 25 mm high, weighing 7 g, with particle dimensions between 0.4 and 0.6 mm. The temperature in the layer was measured with an accuracy of $\pm$ 1 °C; the circulation speed was 600 ml./min with a volume of the system of 800 ml. The gaseous reaction products were frozen out in a trap which was cooled by liquid nitrogen. The ore was heated to the desired temperature in vacuum (10^{-2} to 10^{-3} mm Hg). Following that, a quantity of hydrogen was introduced which was equal in every case, maintaining the pressure constant. The speed of reduction was judged from the consumption of hydrogen in the closed system which was measured every minute. Every three minutes the system was joined to a vacuum and, after that, the temperature was readjusted and the gaseous phase renewed. It could, therefore, be assumed that a number of successive measurements, carried out at 3 min intervals, provided the isotherm of the reduction of the ore. At

Card2/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

each temperature the experiments were carried out with a fresh ore specimen. Since the aim of the work was to elucidate the existence of a relation between the changes in the properties of the iron, at temperatures at which it is known that phase transformations take place, and the kinetics of reduction of iron oxides under equal conditions, the investigations were carried out in the temperature range 700 to 910 °C. In this temperature range magnetic as well as polymorphous transformations take place in the iron at 768 and 906-910 °C, respectively. The speeds of reduction of magnetite, expressed in terms of hydrogen consumption during the first 3 min as a function of the temperature, are graphed in Figure 1. It can be seen that the graph contains several anomalous sections. The obtained results justify revision of certain views expressed

Card 3/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

on the kinetics of reduction of iron oxides. In the first instance, it is quite evident that sintering phenomena, changes in the porosity and recrystallisation of the studied substances and in the reaction products, changes of speed of diffusion and the speed of chemical reactions do occur in the course of variation of the temperature during reduction of the ores and of iron oxides. The most plausible explanation of the anomalous phenomena in the processes of reduction is based on the changes of the state of the iron atoms as a function of the temperature, particularly as regards phase transformations. The obtained results (Figure 1) indicate that the jumps in the speed of reduction at 752-756 °C correspond to the magnetic transformation of the iron and not to the Curie point of the magnetite. Thus, the change in the character of the chemical process at the

Card 4/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

temperature of magnetic transformation of the iron confirms the conclusion that the anomalous phenomena in the chemical and physical processes at various temperatures are based on the changes in the state of the atoms and not on changes of the crystal lattice. It can be seen from the graph, Figure 2 (temperature coefficient of the electric resistance of iron) that the thermal coefficient of the electric resistance changes appreciably in the temperature range 400 to 450 °C and also at 550 and 650 °C.

Card 5/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

The following conclusions are arrived at:
1) The speed of reduction of magnetite with hydrogen decreases in jumps and then again increases within narrow temperature range approaching the following temperatures: magnetic transformation of the iron (752 °C), $Fe_\beta \rightarrow Fe_\gamma$ transformation (906 °C) and at about 820 °C, at which the properties of the iron change considerably.
2) Using the example of the jump-like change in the speed of reduction at temperatures of the magnetic transformation of iron it is shown that the observed anomalies in the kinetics of the process are based on the changes of the electron structure of the iron atoms.
3) The anomalies in the kinetics of reduction of ore are explained more satisfactorily than hitherto from the point of view of transformations taking place in the iron.
4) The results of the here described work can be applied for selecting optimum temperatures for the preparation and processing of ores in the neighbourhood of critical points.

Card 6/7

SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

There are 2 figures and 27 references, 2 of which are Swedish, 1 German, 1 English and 23 Soviet.

ASSOCIATION: Institut metallurgii Ural'skogo filiala AN SSSR (Institute of Metallurgy, Ural Branch of the Ac.Sc.USSR)

SUBMITTED: March 11, 1957

Card 7/7

SOV/24-58-11-32/42

AUTHOR: ~~Kochnev, M. I.~~ (Sverdlovsk)

TITLE: On the Nature of Isothermal Processes in the Blast Furnace (O prirode izotermicheskikh protsessov v domennoy pechi)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 11, pp 121-123 (USSR)

ABSTRACT: In investigating the heat exchange processes in blast furnaces, the charge of which contains ores and fluxes, it was established that the curve of temperature distribution along the height of the furnace is S-shaped (Refs 1-8). It is characteristic that in the central part the temperature in the vertical direction changes very little and is maintained spontaneously in the neighbourhood of 800 to 900°C; the difference between the temperature of the gases and of the charge assumes in this region the minimum value of 5 to 10°C. The presence of this quasi isothermal zone, referred to as the no-load reserve zone or the zone of moderate temperatures, was considered as being a stable, typical relation. However, recent experiments by N. N. Babarykin and F. A. Yushin (Ref 9) have shown that if fluxed agglomerate is smelted without charging ore and limestone, the previously

Card1/3

SOV/24-58-11-32/42

On the Nature of Isothermal Processes in the Blast Furnace

mentioned temperature distribution is not maintained and the temperature curves show two to three isothermal breaks. The cause of these has not been clarified. On the basis of data obtained from practical experience and analysis of the thermal balance of blast furnaces, it can be concluded that in the reserve zone of the blast furnace a considerable development of reduction processes takes place and also an intensification of the processes of heat exchange which is brought about by the isothermal processes. From the correspondence between the temperatures of the change in the properties of iron and its oxides and the temperatures at which the break in the temperature rise occurs in blast furnaces it can be concluded that the appearance of isothermal zones is due to transient states of iron and its oxides, i.e. it is due to the nature of the main reacting substances.

Card2/3

SOV/24-58-11-32/42

On the Nature of Isothermal Processes in the Blast Furnace

There are 23 references, all of which are Soviet.

ASSOCIATION: Institut metallurgii Ural'skogo filiala AN SSSR (Institute of Metallurgy, Ural Branch of the Ac.Sc. USSR)

SUBMITTED: April 17, 1957

Card 3/3

PLEKHANOV, A.F.; KOCHNEV, M.I.

Phase transformations of solid state zinc. Trudy Inst.met.UFAN SSSR no.3:37-42 '59. (MIRA 13:4)
(Zinc) (Phase rule and equilibrium)